

XOCEAN

Ocean data, delivered.

USVs – Efficient Ocean Data Collection in less than 40m water.

NOAA Hydrographic Services Review Panel Public Meeting
02 September 2021



USV Fleet

- XOCEAN operates a fleet of 15 x Uncrewed Surface Vessels (USVs) with an additional 4 vessels in production in 2021.



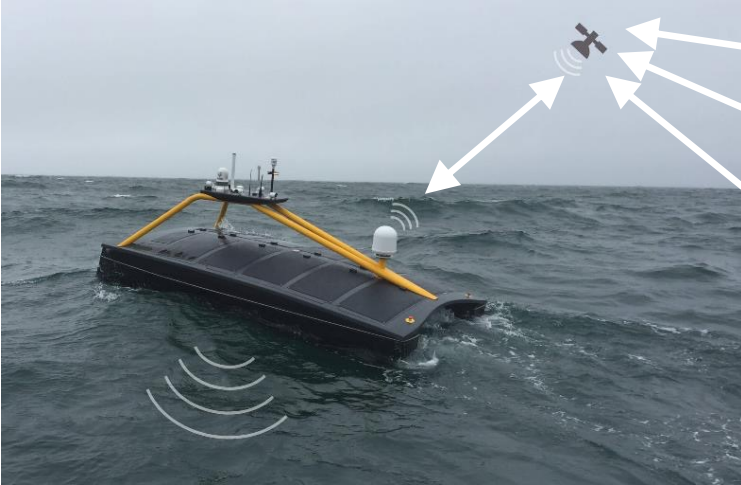
Key Features

- **Sensors:** Power (up to 6.4kW) and payload capacity (up to 500 kg) for commercial grade sensors.
- **Control:** Full 'Over Horizon' satellite operations; real-time monitoring and control.
- **Efficient:** Slipway, crane or vessel launch (LARS); continuous 24/7 operations up to 22 days.



Technology

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XOCEAN CyberDeck

- USV Pilots and Online Surveyors monitor and control the vessels and survey system remotely in real-time 24/7.
 - Platform is uncrewed not autonomous



USV Advantages

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- Using 3 USVs on one project is approx. 25% lower cost and 3 x faster.
- Computers drive boats better than humans and together with smart software makes for more efficient data collection.
- Additional sensors can be used to collect sub-seabed data, weather observations and marine mammals as well as bathymetry.
- Weather downtime lower cost as no-one is on board.



Human Advantages

- Remote access brings the experts to the boats.
- It also allows a more balanced lifestyle including homeworking – ideal for gender balance and Mariners/Surveyors wanting to return to work.
- It is cool tech which attracts the younger generation.
- Working globally means that no-one has to work a night shift.



Environmental Advantages

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- Minimal carbon usage – approximately two gallons of diesel per day
- Quiet and slow platform which doesn't interfere with marine mammals
- All cameras are recorded 24/7 and can be used to identify species.



Efficient Operations

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Launch & Recovery System

- Safely lift and house USVs on a vessel.
- Enables force multiplier approach in more remote locations.
- USV Pilots & Surveyors operating remotely, minimising vessel crew.



Canadian Arctic Surveys 2021

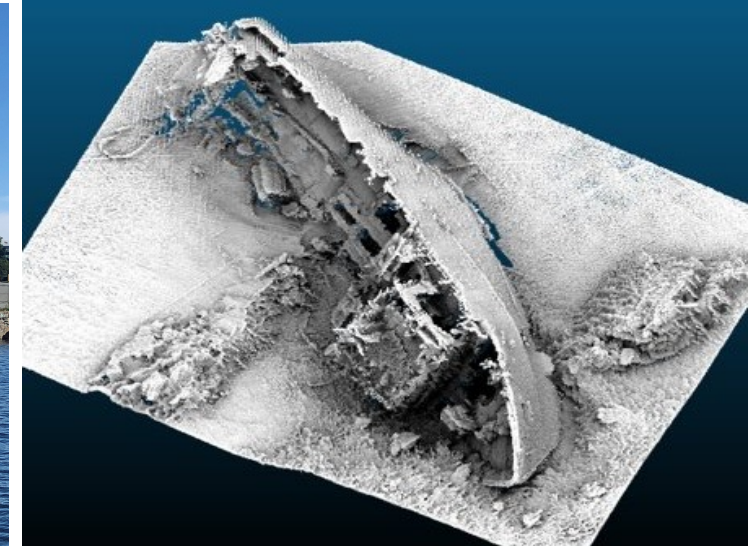
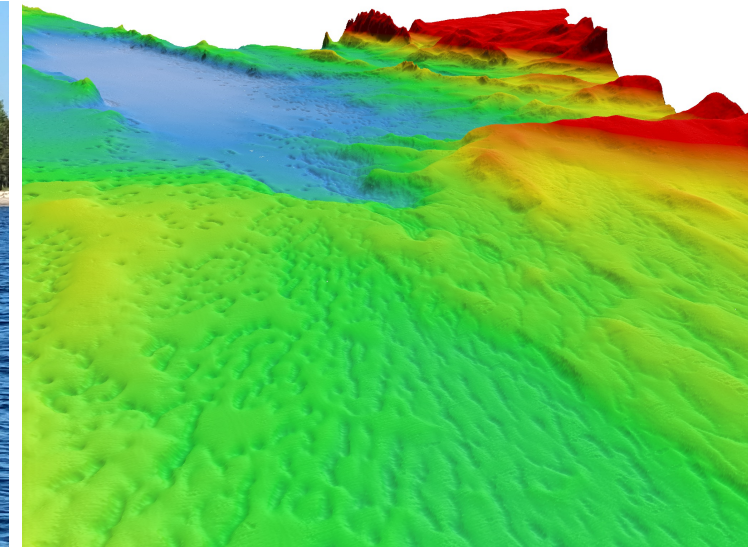
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Vessels

- X0-450 (C30513NS)
- Leeway Odyssey (38m oceanographic research vessel)

Operations to date

- Force multiplier
- Twice the acquisition coverage for small additional cost



Multiple USV Operations

Advantages of multiple USVs

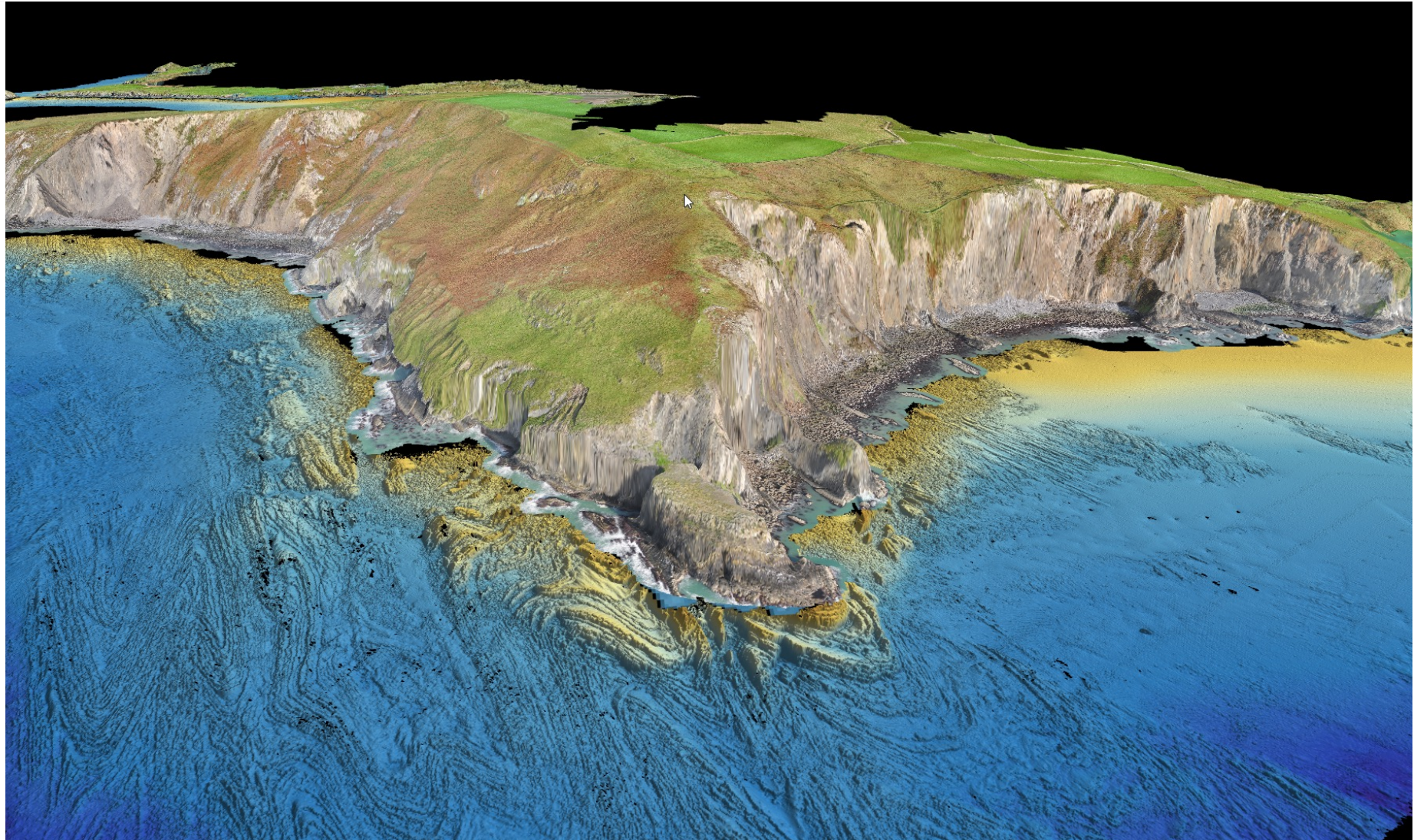
- Shorten survey time to cover an area
- Less resources required to run multiple USVs, therefore lower cost:
 - 1 x USV Pilot per USV
 - 1 x Surveyor for 3 x USVs
 - 2 x Field Ops for 4 x USVs
- Less exposure to weather events.



Combining USVs & UAVs

Coastal Surveys

- Combined USV and UAV method:
 - USV surveys at high water
 - UAV surveys at low water





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